

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VII

PRODUCTION ENGINEERING

Subject Name: **Flexible Manufacturing Systems (Department Elective – I)**

Subject Code: **172506**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	2	0	5	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	FMS Introduction and Description limitations with conventional manufacturing, Need for FMS Introduction, Definition, Basic Component of FMS, Significance of FMS, General layout and configuration of FMS, Principle Objectives of FMS, Benefits and limitations of FMS, Area of Application of a FMS in Industry, Various Hardware and Software required for an FMS, CIM Technology, Hierarchy of CIM, FMS Justification.	08
2.	Manufacturing Cell Introduction, Description and Classifications of Cell, Unattended Machining, Cellular versus Flexible Manufacturing.	03
3.	Group Technology Introduction, Definition, Reasons for Adopting Group Technology, Benefits of Group Technology Affecting Many Areas of a Company, Obstacles to Application of GT.	05
4.	Turning and Machining Centres Introduction, Types ,Construction and Operation Performed on Turning enter, Automated Features and Capabilities of Turning Centres, General Advantages and Disadvantages of Vertical and Horizontal Machining Centres, Pallet and Part Loading and Programming Options in Machining Centres, Automated features and capabilities of a Machining Centres	05
5.	Cleaning and Deburring Equipment Introduction, Wash Station and Operation Description, Deburring Station and Operation Description, Importance of Cleaning and Deburring in Automated Manufacturing.	03

6.	Coordinate Measuring Machines Introduction, Types, Construction and General Functions of CMM, Operational Cycle Description, CMM Applications, Importance to Flexible Cells and Systems.	04
7.	Automated Material Movement and Storage System Introduction, Types of AGV and Their principle of working, Advantages, Limitation and General AGV Guide path, Robots, Benefits of using Industrial Robots, Basic components and benefits of Automated Storage and Retrieval Systems, Conveyors and Pallet Flotation System, Queuing Carrousel and Automatic Work Changers, Coolant and Chip Disposal and Recovery system.	08
8.	Cutting Tools and Tool Management Introduction, Control of Cutting Tools, Tool Management, Tool Strategies, Tool Preset, Identification and Data Transfer, Tool Monitoring and Fault Detection.	02
9.	FMS Installation and Implementation FMS Installation, FMS implementation.	04

Text Books:

1. Flexible Manufacturing System by H. K. Shivanand, M. M. Benal, V. Koti, New Age Pub.
2. Automation, Production Systems and Computer Integrated Manufacturing Groover M.P, Prentice Hall of India.

Reference Books:

1. CAD/CAM – Groover M.P, Zimmers E.W, Prentice Hall of India.
2. Approach to Computer Integrated Design and Manufacturing Nanua Singh, John Wiley and Sons, 1998.
3. Principles of CIM , Vajpayee, PHI
4. Flexible Manufacturing Cells and Systems by Luggen